



**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION**

ORDER NO. 96-069  
NPDES NO. CA0005789

**WASTE DISCHARGE REQUIREMENTS FOR:**

**SHELL MARTINEZ REFINING COMPANY  
MARTINEZ, CONTRA COSTA COUNTY**

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board), finds that:

1. Shell Martinez Refining Company, (hereinafter called the discharger), by application (Report of Waste Discharge) dated November 16, 1994, and subsequent amendments dated April 18, 1995, June 2, 1995, and April 19, 1996, has applied for reissuance of National Pollutant Discharge Elimination System (NPDES) permit No. CA0005789.

**FACILITY DESCRIPTION**

2. The discharger operates a petroleum refinery with an average crude-run throughput of approximately 147,100 barrels per day. The discharger manufactures fuels (e.g. gasoline, diesel) and lubricants and is classified as a lube refinery as defined by the U.S. Environmental Protection Agency (USEPA) in 40 CFR 419.40.
3. The USEPA and the Board have classified this discharger as a major discharger.

**PURPOSE OF ORDER**

4. This NPDES permit regulates the discharge of effluent from the discharger's wastewater treatment plant and the discharges of all storm water associated with industrial activity from the refinery to Carquinez Strait, a water of the United States. These discharges are currently governed by Waste Discharge Requirements specified in Order No. 90-095, adopted by the Board on June 20, 1990. Order No. 90-095 was amended by Order Nos. 91-026 (adopted February 20, 1991), 91-099 (adopted June 19, 1991), and 92-101 (adopted August 19, 1992). The conditions of Order No. 90-095 as amended, were continued in effect past the expiration date, in accordance with NPDES regulations, by letter of the Executive Officer dated May 2, 1995.

**DISCHARGE DESCRIPTION**

5. The discharges are described below and are based on information contained in the Report of Waste Discharge and recent self-monitoring reports. Figure 1 of this Order shows the flow diagram for the process wastewater treatment plant. Figure 2 shows the drainage areas and discharge locations for the discharges.

- a. **Waste 001** consists of 4.93 million gallons per day (MGD) on average of process wastes, cooling tower and boiler blowdown, ballast water, the initial storm water runoff from the Light Oil Processing Area, all storm water runoff from the process areas on the west side of the facility, blowdown from a hazardous waste incinerator, sanitary wastes, and extracted groundwater from on-site remediation activities.

Oily wastewater streams of Waste 001 are first treated in oil water separators, and then combined with non-oily waste streams. Treatment then consists of dissolved nitrogen flotation, activated sludge biological treatment, clarification, sedimentation and finally, granular activated carbon adsorption. The hydraulic capacity of this treatment plant is 10 MGD. During large storm events, if the wastewater is not high in oil and/or solids, a portion of the wastewater may bypass the initial treatment units, namely the oil water separators and/or dissolved nitrogen flotation units. Additionally, a portion of the biologically treated wastewater may bypass the granular activated carbon adsorption units during high flow situations which are caused by storm events. High flow conditions are generally any daily effluent discharge rate of 8.6 MGD or greater. Bypass of carbon treatment is allowed in this permit only when there is no acute toxicity in the wastewater.

A portion of the biologically treated wastewater (about 1.4 MGD) is currently further treated with ferric chloride in Pond 5D for selenium removal, and the discharger is in the process of developing additional selenium treatment measures. More details on this are contained in another finding of this Order. Waste 001 is discharged to Carquinez Strait (lat. 38°01'56", long. 122°07'44") through a 24-inch multiport diffuser, located 20 feet under the Martinez Complex Wharf. The diffuser provides at least 10:1 initial dilution. The general quality of this discharge based on the past 3 years of data is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	<6	2	30
Chemical Oxygen Demand, mg/l	115	44	287
Total Suspended Solids, mg/l	8	2	24
Ammonia as N, mg/l	<1.1	<0.1	22
Oil and Grease, mg/l	<4	<1	14
Total Phenols, mg/l	0.03	0.01	0.07
pH (standard units)	--	6.2	8.5

The discharger put on-line in December 1995, additional treatment units to accommodate increased wastewater flows from the discharger's Clean Fuels Project which is discussed in more detail in other findings contained in this Order. The new units include two dissolved nitrogen flotation units, an aerated basin for powdered activated carbon/sludge treatment, and two clarifiers. These units are used in parallel with the existing facilities. The hydraulic capacity of this new plant is about 5 MGD.

Figure 1 of this Order shows the wastewater sources to Waste 001, and both the existing and new treatment systems.

- b. **Waste 002** consists of storm water runoff from an area of approximately 231 acres, located centrally at the facility. This area includes the Light Oil Processing area, tank farms, and

many of the new units for the Clean Fuels Project. The first flush of runoff from the Light Oil processing area and the Clean Fuels Project area is diverted to the Wastewater Treatment Plant for treatment and discharged as Waste 001. Waste 002 is the runoff for this area that exceeds the diversion pump capacities. This overflow combines with runoff from tank farms and is contained by three ponds in series (commonly referred to as Lake Slobonik). Each pond is equipped with an oil baffle and valve that is normally kept closed. The Waste 002 discharge is at a point 1000 feet east southeast from the intersection of Shell Avenue and Marina Vista, into an unnamed earthen drainage course contiguous with Carquinez Strait (lat. 38°01'21", long. 122°06'38"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	<5	--	--
Chemical Oxygen Demand, mg/l	57	--	--
Total Suspended Solids, mg/l	36	--	42
Total Kjeldahl Nitrogen, mg/l	1.3	--	--
Oil and Grease, mg/l	2.4	--	4
Total Organic Carbon, mg/l	24	--	41
pH (standard units)	--	7.3	8.5

- c. **Waste 004** consists of storm water runoff from a 234-acre tank farm area. The runoff is collected in two ponds in series which are each equipped with an oil baffle and valve which is normally kept closed. The discharge is to an unnamed earthen drainage course at a point about 2000 feet south from the Mt. View Sanitary District treatment plant, then into Carquinez Strait (lat. 38°01'54", long. 122°06'07"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	<5	--	--
Chemical Oxygen Demand, mg/l	51	--	--
Total Suspended Solids, mg/l	47	--	82
Total Kjeldahl Nitrogen, mg/l	1.8	--	--
Oil and Grease, mg/l	2.3	--	4
Total Organic Carbon, mg/l	13	--	19
pH (standard units)	--	7.3	8.1

- d. **Waste 005** consists of storm water runoff from a 31 acre area containing an emergency flare. This runoff is discharged from a pond equipped with an oil baffle and valve (normally kept closed) into a drainage course at a point about 1500 feet south of the Mt. View Sanitary District treatment plant, then into Carquinez Strait (lat. 38°00'55", long. 122°06'07"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Minimum</u>	<u>Maximum</u>
Biochemical Oxygen Demand, mg/l	16	--	--
Chemical Oxygen Demand, mg/l	51	--	--
Total Suspended Solids, mg/l	15	--	23
Total Kjeldahl Nitrogen, mg/l	1.8	--	--
Oil and Grease, mg/l	2.2	--	3
Total Organic Carbon, mg/l	17	--	41
pH (standard units)	--	7.3	8

- e. **Waste 007** consists of storm water runoff from a 7-acre propane/butane storage area. This runoff is discharged from a pond which is equipped with an oil baffle and a valve (normally kept closed) into a drainage course at a point about 3000 feet south of the Mt. View Sanitary District treatment plant, then into Carquinez Strait (lat. 38°01'05", long. 122°06'07"). The general quality of this discharge based on data presented in the application is as follows:

	<u>Average</u>	<u>Maximum</u>	<u>Minimum</u>
Biochemical Oxygen Demand, mg/l	<5	--	--
Chemical Oxygen Demand, mg/l	51	--	--
Total Suspended Solids, mg/l	44	--	83
Ammonia as N, mg/l	0.6	--	--
Oil and Grease, mg/l	1.5	--	2
Total Organic Carbon, mg/l	25	--	41
pH (standard units)	--	6.9	8.4

- f. **Waste 008** consists of storm water runoff from an approximately 5 acre maintenance yard. The runoff discharges to City of Martinez storm drains which in turn discharges to an unnamed earthen drainage course and eventually into Carquinez Strait (lat. 38°01'05", long. 122°06'07"). No data are currently available on the quality of this discharge. Monitoring will be required as part of this Order.

#### **APPLICABLE PLANS, POLICIES AND REGULATIONS**

6. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21, 1995. This updated and consolidated plan represents the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board (State Board) and the Office of Administrative Law on July 20 and November 13, respectively, of 1995. A summary of regulatory provisions is contained in Title 23 of the California Code of Regulations at Section 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface and ground waters.
7. Effluent limitation guidelines requiring the application of best available technology economically achievable (BAT) have been promulgated by the USEPA for the Integrated Subcategory of the Petroleum Refining Point Source Category 40 CFR Part 419 on October 18, 1982, and amended on July 12, 1985. These limitations are applicable to the discharge.
8. This Order contains effluent limitations based on recent production rates at this facility and projected increases in production rates resulting from the Clean Fuels Project. The Board is aware that production can vary in the future and will expedite reissuance of a new permit pursuant to 40 CFR 122.62 and 124.5 upon receipt of an application with new production data.
9. Effluent limitations and toxic effluent standards established pursuant to Sections 208(b), 301, 304, and 307 of the Federal Water Pollution Control Act and amendments thereto are applicable to the discharge.
10. Pursuant to 40 CFR 122.44, "Establishing Limitations, Standards, and Other Permit Conditions," NPDES permits should also include toxic pollutant limitations if the discharger uses or

manufactures a toxic pollutant as an intermediate or final product or byproduct. This permit may be modified prior to the expiration date, pursuant to 40 CFR 122.62 and 124.5, to include effluent limitations for toxic constituents determined to be present in significant amounts in the discharge through a more comprehensive monitoring program included as a part of this Order.

## **BENEFICIAL USES**

11. The beneficial uses of Carquinez Strait and contiguous waters are:

- a. Water contact recreation
- b. Non-contact water recreation
- c. Navigation
- d. Commercial and sport fishing
- e. Wildlife habitat
- f. Estuarine habitat
- g. Fish spawning and migration
- h. Industrial service supply
- i. Preservation of rare and endangered species

## **BASIS FOR REQUIREMENTS**

12. Effluent and receiving water limitations in this Order are based on the plans, policies, and water quality objectives and criteria of the Basin Plan, *Quality Criteria for Water* (EPA/5-86-001, 1986; Gold Book), applicable Federal Regulations (40 CFR Parts 122 through 131), the National Toxics Rule (57 FR 60848, 22 December 1992; NTR), and best professional judgement.
13. The establishment of many of the chemical specific limitations depend upon the salinity characteristics of the receiving waters. Data contained in Annual Report for San Francisco Bay Estuary Regional Monitoring Program for Trace Substances (1993 and 1994) for station BF10, and data from the Department of Water Resources (for the years 1993, 1992, 1986, 1985 and 1984) for station D6 located close to the Benicia Bridge show that the salinity of the receiving water is above 5 parts per thousand greater than ninety-five percent of the time. Based on these data, the salinity in the vicinity of the discharges is brackish and marine in character.
14. The effluent limit for copper included in this permit is based on 4.9 µg/l copper as an interpretation of the narrative toxicity objective in the Basin Plan, based on best professional judgement. From a technical standpoint, 4.9 µg/l is currently the best available criterion that is protective of the most sensitive designated use of San Francisco Bay marine waters with respect to copper: habitat for aquatic organisms. The criterion is based on the Regional Board's study to develop a site-specific objective for copper, which employed the "water effect ratio" approach developed by the USEPA. This approach provides a measure of the binding capacity of natural waters (dependent on particulate matter) relative to the binding capacity of reference waters (filtered oceanic water). The study and associated staff analysis are described in a September 25, 1992, Board staff report entitled "Revised Report on Proposed Amendment to Establish a Site Specific Objective for Copper for San Francisco Bay."

## **Clean Fuels Project**

15. In compliance with new requirements for cleaner burning fuels in California, the discharger is currently constructing and will put on-line several new production units in stages over the next three years. This project is called the Clean Fuels Project (CFP). These new units include isomerization units, hydrotreaters, sour water strippers, a hydrogen plant, a cogeneration plant, a cooling tower, and a delayed coker. These new units are expected to change the existing quality of the process wastewater and increase the volume of wastewater discharge by an average of 1.39 million gallons per day. An Environmental Impact Report dated May 1993 and Response to Comments dated August 1993 was prepared to address the impacts of the CFP. The impacts related to the discharges covered under this NPDES permit are described in the following findings.
16. The EIR identified that mitigation is required to minimize significant impacts from increases in selenium discharges from the CFP. The mitigation involves recycling in hydrotreaters selenium rich stripped sour water streams to concentrate the selenium, and then using the concentrated stream as make up water in the new delayed coker. Data from bench tests show that most of the selenium partitioned onto the coke during the quenching process. Because of concerns about selenium discharges, this mitigation measure is required to remove as much selenium as the CFP processes would add in order to achieve no net increase in the selenium discharged from the facility.
17. In the EIR's response to comments, it was indicated that some increases of cyanide and nickel may occur from the new delayed coker. To minimize this, the process would be designed to reduce corrosion which contributes cyanides to the sewer. To eliminate any increases in nickel, coke cutting and transport water would be recycled.
18. As part of the CFP, a new lube hydrotreater was put on-line in December 1, 1995, and a delayed coker is scheduled to be put on-line on December 1, 1996. These units increases by more than 20 percent the discharger's production capacities under the coking and lube process configuration. Alternate production rate based BAT effluent limitations in accordance with USEPA guidance are specified in this Order which takes into account these scheduled increases in production.

## **Selenium**

19. On February 20, 1991, and June 19, 1991, the Board adopted Order Nos. 91-026 and 91-099, respectively, amending the NPDES permits for all six refineries in the region, including the discharger, to add concentration and mass emission rate limitations for selenium. Order No. 91-026 specified a limit of 50 ppb as a daily maximum. Order No. 91-099 specified an interim limit for the discharger of 5.8 lb/day as a running annual average, and a schedule for compliance with a final limit of 2.13 lb/day by December 12, 1993.
20. On October 16, 1992, the Western States Petroleum Association (WSPA) filed a Petition with the Superior Court for the County of Solano on behalf of the six oil refineries seeking to set aside Order Nos. 91-026 and 91-099. On January 19, 1994, the Board adopted Resolution No. 94-016 which approves the Settlement Agreement between WSPA and the Board. Additionally, the Board adopted Cease and Desist Order No. 94-015 for the three oil refineries not in compliance with the limits specified in Order Nos. 91-026 and 91-099. The discharger is one of these refineries. CDO

No. 94-015 set forth a schedule for compliance with the limits by July 31, 1998. This Order reiterates the requirements of Order Nos. 91-026, 91-099 and CDO No. 94-015.

### **Effluent Limits Added**

21. Effluent limits for benzene, toluene, fluoranthene, PCBs, and dioxins (expressed as TCDD Equivalents), and a more stringent monthly limit for mercury and PAHs have been added to the discharger's permit by this Order. Limits on these pollutants are warranted because there are potential sources of these pollutants in the discharger's process wastewater. Mercury, PCBs, dioxins, and PAHs have been measured in San Francisco Bay waters, sediments and/or fish tissue at levels of concern. This last finding is based on data contained in Annual Report for San Francisco Bay Estuary Regional Monitoring Program for Trace Substances (1993 and 1994), and Contaminant Levels in Fish Tissue From San Francisco Bay (Final Report June 1995). Furthermore, the California Office of Environmental Health Hazard Assessment issued in December 1994, an interim Health Advisory on Catching and Eating Fish due to health concerns from exposure to sport fish contaminated with methylmercury, PCBs, and dioxins. The new effluent limits are based on levels necessary to protect the most sensitive beneficial use: human consumption of fish.
22. Discharge data show that the discharge is within the new effluent limits for benzene, toluene, and fluoranthene. So the limits for these constituents are effective immediately. Discharge data also show that the discharge is not within the more stringent limit for mercury. A compliance schedule is specified for mercury. This is discussed in more detail below. For PAHs, PCBs, and dioxins, the discharge data show non-detects for these pollutants at the analytical reporting limit. However the analytical reporting limit is above the new effluent limits specified. This is discussed in more detail below.

### **Mercury**

23. A monthly average effluent limit for mercury in Waste 001 is specified in this permit that is more stringent than in the previous permit. Discharge data show that the discharger is currently not able to comply with the more stringent limit. This Order specifies a permit compliance schedule in accordance with the Basin Plan. The schedule requires source investigation and development and implementation of reduction measures. Compliance with the limit is required by July 31, 1999.

### **Analytical Detection Limits**

24. At the present time, the analytical quantification limits available from commercial laboratories using approved USEPA protocols are not low enough to determine compliance with the effluent limits for PCBs, and dioxins (TCDD Equivalents). This Order will require compliance with these effluent limits to be determined at the higher analytical quantification limits specified in the Self-Monitoring Program. This is in accordance with policy established in the Basin Plan, and USEPA guidance provided in the NTR and other documents.
25. Because analytical quantification limits may improve, this Order specifies that the Executive Officer may change the quantification limits prior to the expiration date of this permit. However, if quantification limits are improved and analyses show the presence of PCBs, or TCDD Equivalents



at levels above the effluent limitation, the discharger may continue to determine compliance at the former quantification limits. In this case, the discharge will be required to implement a source identification study and investigate feasible methods for reducing the pollutant in order to achieve compliance with the effluent limit. This provision to trigger a compliance investigation instead of immediate permit violation is consistent with the Basin Plan policy for compliance schedules in cases where the discharger's current performance has not worsened but the limits have become more stringent and treatment modifications are needed to improve performance.

#### **Effluent Limits Deleted from Previous Permit**

26. The daily average effluent concentration limits for arsenic, cadmium, and hexavalent chromium in Waste 001 specified in Order No. 90-095 have been deleted from the list of effluent limits of this Order. Mass emission limits for chromium as required by 40CFR419D have not been removed. The basis for the deletion is that the discharge of these pollutants by the discharger do not pose a reasonable potential to cause, or contribute to an excursion above any numeric or narrative water quality objective. This conclusion is based on consideration of ambient receiving water data and self-monitoring data. The receiving water data relied upon are contained in Annual Report for San Francisco Bay Estuary Regional Monitoring Program for Trace Substances (1993 and 1994), Trace Element Cycles in the S.F. Bay Estuary [Flegal et al., 1991], and Contaminant Levels in Fish Tissue From San Francisco Bay (Final Report June 1995). The self-monitoring data considered was from the past five years (1991 to 1995), and Board staff compliance inspection data from the past three years (1993 to 1995). These data show that the discharge concentrations of arsenic, cadmium and hexavalent chromium are not at ambient levels of concern. These constituents are not used in the manufacturing process by the discharger. The discharge data consistently show either very low levels or non-detect levels below the effluent limit. Monitoring for these constituents will remain in the permit to ensure there are no impacts on these constituents from the Clean Fuels Project changes. A re-opener provision is part of this Order that requires the discharger to notify the Board of material changes in its manufacturing and treatment processes and that would allow the Board to amend the permit as appropriate.
27. The daily average effluent concentration limit for PAHs in Waste 001 specified in Order No. 90-095 have been deleted because this limit is superseded by the more stringent monthly average limit for PAHs specified in this Order. Additionally, past discharge data show that the daily average limit is not necessary because there is no reasonable potential for the discharger to exceed the limit. Past data consistently shows levels below 1 µg/l.
28. Residual chlorine effluent limit in Waste 001 specified in Order No. 90-095 have been deleted from the list of effluent limits of this Order. The limit for residual chlorine is not necessary because the discharger does not use chlorine to disinfect its sanitary wastes.

#### **Local Effects Monitoring Program**

29. The discharger was required as a provision of the previous permit to study the potential for accumulation of metallic and organic compounds, and selenium in San Francisco Bay organisms and sediment. These studies are called the Local Effects Monitoring Program (LEMP). Subsequent to a pilot LEMP conducted in 1991 at the Unocal Refinery in Rodeo, California, the discharger initiated a similar program in 1993 with the bioaccumulation in organisms component

conducted as part of a multi-refinery study implemented by the Western States Petroleum Association (WSPA).

30. The discharger submitted a report entitled "Evaluation of Concentrations of Trace Elements and Hydrocarbons in Sediments Adjacent to the Outfall of the Shell Oil Martinez Manufacturing Complex" dated October 13, 1995. The report concluded that four hydrocarbons measured were found to meet the criteria for potential effluent related accumulation in sediments. Definitive, conclusions regarding trace metals and elements could not be made because of the lack of a pattern showing decreasing concentrations away from the outfall. However, the concentrations in sediments near the outfall were significantly greater than the reference site.
31. WSPA submitted a report entitled "Local Monitoring Program for Refinery Effluents in the San Francisco Bay-Delta System, Bioaccumulation Component (Phase II)" dated January 31, 1996. This report was received by the Board on April 30, 1996, and is currently being reviewed by Board staff.

### **Regional Monitoring Program**

32. On April 15, 1992, the Regional Board adopted Resolution No. 92-043 endorsing the concept of the the Regional Monitoring Plan for San Francisco Bay and directed the Executive Officer to develop and implement a Regional Monitoring Program. Subsequent to a public hearing and various meetings, the Regional Board staff requested major permit holders in this region, under authority of California Water Code Section 13267, to report on the water quality of the estuary. These permit holders, including the discharger, responded to this request by participating in a collaborative effort, through the San Francisco Estuary Institute (formerly the Aquatic Habitat Institute). This effort has come to be known as the San Francisco Bay Regional Monitoring Program for Trace Substances (RMP). The RMP involves collection of data on pollutants and toxicity in water, sediment and biota of the estuary. Annual reports from the RMP has been referenced elsewhere in this Order. In return for the discharger's participation in the RMP, the effluent and receiving water self-monitoring requirements have been reduced for the discharger. For this reason, this order specifies that the discharger shall continue to participate in the RMP.

### **Reclaimed Water Use**

33. On May 18, 1988, the Board adopted Resolution No. 88-083, "Statement of Support for Municipal Wastewater Reused in Petroleum Refinery Operations, Contra Costa County."
34. In the future, the discharger may use an unspecified volume of reclaimed water, provided by the Central Contra Costa Sanitary District (hereinafter CCCSD) and the Contra Costa Water District for cooling tower make-up water or boiler feed water. The most likely source of the reclaimed water is the permitted discharge (or treated effluent) from the treatment plant operated by the CCCSD (NPDES Permit No. CA0037648). The pollutants in the discharger's Waste 001 discharge may be increased as a result of use of reclaimed water because of the pollutants present in the CCCSD effluent. This Order allows for an increase in pollutants in Waste 001 resulting from use of reclaimed water. There will be no net increase of pollutants discharged from the combined discharges of the discharger and CCCSD as a result of this allowance.

## CEQA AND PUBLIC NOTICE OF ACTION

35. The reissuance of waste discharge requirements for this discharge is exempt from the provisions of Chapter 3 (commencing with Section 21000 of Division 13) of the Public Resources Code (CEQA) pursuant to Section 13389 of the California Water Code.
36. The Board has notified the discharger and interested agencies and persons of its intent to reissue waste discharge requirements, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
37. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

**IT IS HEREBY ORDERED** that the discharger, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Federal Water Pollution Control Act and regulations and guidelines adopted thereunder, shall comply with the following:

### A. DISCHARGE PROHIBITIONS

1. The discharge of Waste 001 at any point at which the wastewaters do not receive an initial dilution of at least 10:1 is prohibited.
2. The by pass or overflow of untreated or partially treated Waste 001 to waters of the State, either at the treatment plant or from the collection system except as described in Finding 5 is prohibited. Bypass of granular activated carbon treatment described in Finding 5 with a portion of the biologically treated wastewater is permitted only if all of the following conditions are met: 1) during a high flow condition caused by a storm event, 2) the discharger is monitoring for acute toxicity, and 3) the bypass did not cause nor contribute to non-compliance with the acute toxicity effluent limitation. For the purposes of this prohibition, high flow condition is defined as a daily discharge rate equal to or greater than 8.6 MGD.

### B. EFFLUENT LIMITATIONS

#### **Production Based Mass Emission Limits**

1. The discharge of **Waste 001** containing constituents in excess of any of the following mass loading limits is prohibited:
  - a. The following limitations are effective until the Alternate Limitations specified in B.1.b. become effective:

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
BOD (5-day @ 20C)	lb/day	1,830	3,600
	kg/day	830	1,630

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
TSS	lb/day	1,610	2,510
	kg/day	730	1,140
COD	lb/day	13,300	25,600
	kg/day	6,020	11,600
Oil & Grease	lb/day	604	1,150
	kg/day	274	520
Phenolic Compounds	lb/day	8.77	26.8
	kg/day	3.98	12.1
Ammonia as N	lb/day	765	1,670
	kg/day	347	757
Sulfide	lb/day	10.7	23.7
	kg/day	4.85	10.8
Total Chromium	lb/day	10.3	29.5
	kg/day	4.67	13.4
Hexavalent Chromium	lb/day	0.85	1.88
	kg/day	0.39	0.85

- b. The following **Alternate Limitations** are effective starting on June 1, 1997, or when both the new lube hydrotreater and delayed coker is operated at full or at least 80 percent of full production rates, whichever date is later. For the new lube hydrotreater, full production rate is 7.0 thousand barrels per calendar day; for the delayed coker, 65 thousand barrels per calendar day. These alternate limitations shall not become effective until the discharger submits a report certifying that the new units are operational and that the conditions for the alternate limits are met. This certification shall be accompanied with a minimum of 6 months of supporting production data for these production units:

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
BOD (5-day @ 20C)	lb/day	3,040	5,980
	kg/day	1,380	2,710
TSS	lb/day	2,670	4,170
	kg/day	1,210	1,890
COD	lb/day	22,000	42,400
	kg/day	10,000	19,200

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
Oil & Grease	lb/day	1,000	1,900
	kg/day	454	863
Phenolic Compounds	lb/day	11.6	44.4
	kg/day	5.26	20.1
Ammonia as N	lb/day	1,270	2,770
	kg/day	576	1,260
Sulfide	lb/day	17.7	39.4
	kg/day	8.03	17.9
Total Chromium	lb/day	13.5	39.0
	kg/day	6.12	17.7
Hexavalent Chromium	lb/day	1.11	2.48
	kg/day	0.50	1.12

#### **Storm Water Runoff and Ballast Water Allocations**

- In addition to the monthly average and daily maximum pollutant weight allowances shown in B.1.a. and b., allocations for pollutants attributable to storm water runoff discharged as a part of Waste 001 are permitted in accordance with the following schedules:

#### **STORM WATER RUNOFF ALLOCATION**

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
BOD (5-day @ 20C)	mg/l	26	48
TSS	mg/l	21	33
COD	mg/l	180	360
Oil & Grease	mg/l	8	15
Phenolic Compounds	mg/l	0.17	0.35
Total Chromium	mg/l	0.21	0.60
Hexavalent Chromium	mg/l	0.028	0.062

### BALLAST WATER ALLOCATION

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
BOD	mg/l	26	48
TSS	mg/l	21	33
COD	mg/l	240	470
Oil & Grease	mg/l	8	15
pH	within the range of 6.0 to 9.0		

The total effluent limitation is the sum of the storm water runoff allocation, the ballast water allocation and the mass limits contained in B.1. The discharger shall compute the total effluent limitation (both maximum and average) on a monthly basis as shown in Part B of the Self-Monitoring Program.

### **Selenium**

3. The discharge of Waste 001 containing selenium constituents in excess of the following limits is prohibited:

Concentration Limit:  
(Daily maximum)<sup>[1]</sup>

50 µg/l

Mass Emission Limit:  
(Running annual average)<sup>[1,2]</sup>

2.13 lb/day

<sup>[1]</sup> These limits are effective immediately. Pending compliance with the 50 µg/l selenium limit, the discharger shall comply with a mass emission rate of 5.8 lb/day as a running annual average as required by the Settlement Agreement and Cease and Desist order No. 94-015 referenced above.

<sup>[2]</sup> Mass emission rate for selenium shall be based on running annual averages. Running annual averages shall be calculated by taking the arithmetic average of the current daily mass loading value, and all of the previous year's values.

### **Toxic and Conventional Pollutants**

4. The discharge of Waste 001 containing constituents in excess of the following concentration limits is prohibited:

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Average</u>
Copper	µg/l	--	36
Lead	µg/l	--	53

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Average</u>
Mercury <sup>[1]</sup>	µg/l	0.21 <sup>[1]</sup>	1
Nickel	µg/l	--	65
Silver	µg/l	--	23
Zinc	µg/l	--	580
Cyanide <sup>[2]</sup>	µg/l	--	25
Oil & Grease	mg/l	8	15
Total Phenols	µg/l	--	500
Settleable Solids	ml/l-hr	0.1	0.2
PAHs <sup>[3]</sup>	µg/l	0.49	
PCBs, total <sup>[3]</sup>	µg/l	0.0007 <sup>[4]</sup>	0.3 <sup>[4]</sup>
TCDD Equivalents <sup>[3]</sup>	pg/l	0.14 <sup>[4]</sup>	--
Benzene	mg/l	0.21	--
Toluene	mg/l	3,000	--
Fluoranthene	µg/l	420	--

<sup>[1]</sup> The discharger shall comply with the monthly average limit for mercury in accordance with the tasks and time schedule specified in Provision D.1 of this Order.

<sup>[2]</sup> The discharger may, at their option, meet the limit for cyanide as free cyanide, simple alkali metal cyanides, and weakly complexed organometallic cyanides. These forms of cyanide shall be measured using the Weak Acid Dissociable Cyanide method described in the most recent edition of Standard Methods, or another method approved by the Executive Officer.

<sup>[3]</sup> See Attachment A for definition of terms.

<sup>[4]</sup> At the present time, the analytical reporting limits available from commercial laboratories using approved USEPA protocols are not low enough to determine compliance with the above limits for PCBs, and TCDD Equivalents. Until the analytical protocols are improved or new ones developed to allow measurement of these pollutants at lower levels, compliance with these limits shall be determined at the analytical quantification limits specified in the Self-Monitoring Program. Because analytical quantification limits may be improved, the Executive Officer may change these quantification limits prior to the expiration date of this permit. If quantification limits are improved and analyses show the presence of PCBs, or TCDD Equivalents at levels above the effluent limitation, the discharger shall continue to determine compliance at the former quantification limits, and shall immediately implement the conditions of Provision 4 of this Order.

5. **EFFLUENT LIMIT B.4 CREDIT FOR RECLAIMED WATER USE:** When the discharger uses reclaimed water as influent water for cooling tower make-up water, credit for influent concentrations of the constituents listed in B.4 above, shall be granted in the discharge according to the following procedure.
- The discharger shall sample and analyze for constituents for which effluent limit credit is sought at least as frequently as is required in Part B of the attached Self-Monitoring Program for that constituent. Influent sampling shall occur at influent sampling station I-001 defined in Part B of the Self-Monitoring Program.
  - The discharger shall determine the time interval between introduction of a given constituent of concern in the influent reclaimed water and the first appearance of the constituent in the final effluent. This determination is subject to approval by the Executive Officer, and must precede any calculation of effluent limit credit for the constituent.
  - Credit for constituents listed in B.4 will be given on a mass basis. Influent concentration multiplied by total influent reclaimed water flow volume for that monitoring interval will yield an influent mass for each constituent, which is valid for that monitoring interval. After the appropriate time lag interval described in b. above, this influent mass of the constituent is then divided by the total effluent flow volume for that monitoring period to give a concentration credit for the effluent which will apply for the monitoring interval. This concentration credit is added to the existing concentration limit. The monitoring interval is the time between sampling days. For example, weekly sampling yields a one week monitoring interval. A schematic example follows:  
  
ex. Constituent B is monitored weekly. The lag time is Y days.  
  
Step 1:  $(\text{Influent conc. of B}) \times (\text{Total Influent Volume of Reclaimed Water for one week}) = (\text{Influent mass of B})$   
  
Step 2:  $(\text{Influent mass of B}) - (\text{Total Waste 001 discharge volume for one week, Y days after influent week}) = (\text{Concentration credit to be added to existing concentration limit, valid for that one week period})$
6. Waste 001 shall not be discharged with a pH outside the range of 6.0 to 9.0.
7. Total coliform bacteria for a median of 5 consecutive samples of Wastes 001, or the combined flow from which all sanitary wastes are present shall not exceed 240 MPN/100ml. Any single sample shall not exceed 10,000 MPN/100ml when verified by a repeat sample taken within 48 hours.

#### **Whole Effluent Toxicity**

8. Waste 001, as discharged, shall meet the following acute toxicity limitation:



The survival of test fish<sup>[1]</sup> in parallel 96-hour flow-through bioassays of Waste 001 as discharged shall be an eleven sample<sup>[2]</sup> median value of not less than 90 percent survival, and an eleven sample 90 percentile<sup>[3]</sup> value of not less than 70 percent survival.

[1] Test fishes as specified by the Executive Officer in the Self-Monitoring Program.

[2] A bioassay test showing survival of less than 90 percent represents a violation of this effluent limit, if five or more of the past ten or less bioassay tests show less than 90 percent survival.

[3] A bioassay test showing survival of less than 70 percent represents a violation of this effluent limit, if one or more of the past ten or less tests shows less than 70 percent survival.

9. Waste 001, as discharged shall meet both of the following chronic toxicity limitations:

a. an eleven sample median value<sup>[1]</sup> of 10 TUC<sup>[2]</sup>; and

b. a 90 percentile value<sup>[3]</sup> of 20 TUC<sup>[2]</sup>.

[1] A test sample showing chronic toxicity greater than 10 TUC represents consistent toxicity and a violation of this limitation, if five or more of the past ten or less tests show toxicity greater than 10 TUC.

[2] A TUC equals 100/NOEL. The NOEL is the no observable effect level, determined from IC, EC, or NOEC values. These terms and their usage in determining compliance with the limitations are defined in Attachment B of this Order. The NOEL shall be based on a critical life stage test using the most sensitive test species as specified by the Executive Officer. The Executive Officer may specify two compliance species if test data indicate that there is alternating sensitivity between the two species. If two compliance test species are specified, compliance shall be based on the maximum TUC value for that discharge sample based on a comparison of TUC values obtained through concurrent testing of the two species.

[3] A test sample showing chronic toxicity greater than 20 TUC represents consistent toxicity and a violation of this limitation, if one or more of the past ten or less tests shows toxicity greater than 20 TUC.

10. The discharge of Wastes 002, 004, 005, 007 and 008 containing constituents in excess or outside of the following limits is prohibited:

<u>Constituent</u>	<u>Units</u>	<u>Limitation</u>
pH	standard units	within 6.5 to 8.5
Oil & Grease	mg/l	daily maximum of 15
TOC	mg/l	daily maximum of 110
visible oil	-	none observed
visible color	-	none observed

### **C. RECEIVING WATER LIMITATIONS**

1. The discharge of wastes shall not cause the following conditions to exist in waters of the State at any place at levels that cause nuisance or adversely affect beneficial uses:
  - a. Floating, suspended, or deposited macroscopic particulate matter or foam;
  - b. Bottom deposits or aquatic growths;
  - c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;
  - d. Visible, floating, suspended, or deposited oil or other products of petroleum origin;
  - e. Toxic or deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.
2. The discharge of waste shall not cause the following limits to be exceeded in waters of the State in any place within one foot of the water surface:
  - a. Dissolved oxygen: 7.0 mg/l minimum. The median dissolved oxygen concentrations for any three consecutive months shall not be less than 80 percent of the dissolved oxygen content at saturation.
  - b. Dissolved sulfide: 0.1 mg/l maximum.
  - c. pH: The pH shall not be depressed below 6.5 nor raised above 8.5, nor caused to vary from normal ambient pH levels by more than 0.5 units.
  - d. Un-ionized ammonia (as N): 0.025 mg/l Annual Median, and 0.16 mg/l Maximum at any time.
3. The discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the State Board as required by the Federal Water Pollution Control Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 or the Federal Water Pollution Control Act or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

#### D. PROVISIONS

1. **Compliance Schedule for Mercury:** The discharger shall comply with the monthly average effluent limit for mercury specified in B.4 in accordance with the following tasks and time schedule:

<u>Task</u>	<u>Compliance Date</u>
a. Conduct a thorough investigation to determine the sources of mercury in the Waste 001 discharge. Sources to investigate shall include at a minimum chemicals used at the facility, and manufacturing processes which may release mercury to wastewater streams.	Initiate investigation by July 1, 1996.
b. Submit a report acceptable to the Executive Officer identifying measures which may reduce the levels of mercury in the Waste 001 discharge, and a plan to conduct the necessary bench tests and/or pilot studies to determine the technical and economic feasibility of the measures identified. The control measures may include source elimination or treatment technologies.	July 1, 1997
c. Implement and/or install the control measures in accordance with the results and findings of the previous task.	January 1, 1999
d. Submit quarterly status reports on the work performed pursuant to Task 1.a. through c. The scope of these reports shall be similar to that described in Provision D.2., and may be combined with those reports.	15 days following the end of each calendar quarter. The first report is due on July 15, 1996.
e. Achieve full compliance with Effluent Limit B.4 monthly average limit for mercury of 0.21 µg/l.	July 31, 1999

2. **Status Reports on Selenium Removal Technology:** The discharger shall submit status reports quarterly which at a minimum describes a) the status and results of pilot tests of chosen technology(ies) for removal of selenium, b) the status and results of other studies being conducted or undertaken by the discharger to reduce selenium in the discharge, and c) the progress of contracting, construction or implementation activities, and foreseeable delays and actions taken or will be taken to minimize those delays. The status reports are due 15 days following the end of each calendar quarter.

3. **Storm Water Pollution Prevention Plan:** The discharger shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) acceptable to the Executive Officer. The SWPPP shall cover the entire facility owned and operated by the discharger. It shall describe the management and handling of storm water runoff from the facility, and measures taken to prevent contamination of storm water or discharge of pollutants with the storm water. As part of the SWPPP, the discharger shall 1) identify on a map of appropriate scale the areas which contribute runoff to the permitted discharge points, 2) describe the activities on each area and the potential for contamination of the runoff, and 3) address the feasibility for containment and/or treatment of the storm water. The discharger shall submit the SWPPP acceptable to the Executive Officer by September 1, 1996, and within 30 days shall implement the SWPPP.

Henceforth, the discharger shall evaluate and update the SWPPP by July 1 of each year, or sooner if there is a change in the operation of the facility which may substantially affect the quality of the storm water discharged from the facility. The annual update shall be timed with the preparation and submittal of the annual storm water report required in the Self-Monitoring Program. The discharger shall submit revisions to the Executive Officer.

4. **Compliance Schedule for Detection Limited Constituents:** If the analytical methods for PCBs and TCDD Equivalents are improved or new methods developed which improves (or lowers) the analytical quantification limit beyond those specified in the Self-Monitoring Program, and the discharger using the new or improved methods finds either of the above pollutants present at levels above their effluent limits specified in B.4, but below the former analytical quantification limits established, the discharger shall notify the Executive Officer, accelerate monitoring for the pollutant of concern to characterize the discharge, and within 60 days develop and initiate a source identification and reduction investigation acceptable to the Executive Officer. During this time, compliance with the B.4 effluent limits shall be determined at the former analytical quantification limits specified in the Self-Monitoring Program provided the discharger is aggressively pursuing the source investigation.
5. **Screening Phase for Chronic Toxicity:** By March 1, 1997, the discharger shall submit a proposal acceptable to the Executive Officer describing the details of a screening phase to determine the most sensitive test species for subsequent routine compliance monitoring for chronic toxicity. The proposal shall contain, at a minimum, the elements specified in Attachment B of this Order. Specifically, the test species shall include *Holmesimysis costata* and *Mysidopsis bahia*. Other test species using recent USEPA protocols may also be considered. The discharger shall conduct the screening phase testing and submit a report of the results by October 1, 1997.

The discharger shall conduct another screening phase compliance monitoring if there is any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant concentrations attributable to pretreatment, source control, and waste minimization efforts.

6. **TRE for Chronic Toxicity:** If there is a violation of the chronic toxicity effluent limitation, the discharger shall conduct a chronic toxicity reduction evaluation (TRE), which shall initially involve a toxicity identification evaluation (TIE). The TIE shall be in accordance with a work plan acceptable to the Executive Officer. The TIE shall be initiated within 30

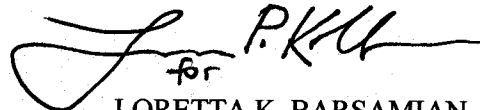
days of the date of violation. The objective of the TIE shall be to identify the chemical or combination of chemicals that are causing the observed toxicity. Every effort using currently available TIE methodologies shall be employed by the discharger. As toxic constituents are identified or characterized, the discharger shall continue the TRE by determining the source(s) of the toxic constituent(s) and evaluating alternative strategies for reducing or eliminating the constituent(s) from the discharge. All reasonable steps shall be taken to reduce toxicity to the required level. The Board recognizes that identification of causes of chronic toxicity may not be successful in all cases. Consideration of enforcement action by the Board will be based in part on the discharger's actions in identifying and reducing sources of consistent toxicity.

7. **Regional Monitoring Program:** The discharger shall continue to participate in the Regional Monitoring Program (RMP) for trace substances in San Francisco Bay in lieu of more extensive effluent and receiving water self-monitoring requirements that maybe imposed by the Executive Officer.
8. **Self-Monitoring Program:** The discharger shall conduct monitoring in accordance with the attached Self-Monitoring Program as adopted by the Board. The Self-Monitoring Program may be amended by the Executive Officer pursuant to USEPA regulations 40 CFR 122.62, 122.63, and 124.5.
9. **Permit Reopener:** Pursuant to USEPA regulations 40 CFR 122.44, 122.62, and 124.5, this permit may be modified prior to the expiration date to
  - a. include effluent limitations for toxic constituents determined to be present in significant amounts in the discharge through a more comprehensive monitoring program included as part of this Order, or
  - b. revise the definition of the NOEL contained in Attachment A of this Order based on guidance or policy from the State Board.
10. **Signatory and Certification:** All applications, reports, or information submitted to the Board shall be signed and certified pursuant to USEPA regulations 40 CFR 122.41(k).
11. **Notification on Changes:** Pursuant to USEPA regulations, 40 CFR 122.41(a), the discharger shall notify the Board as soon as it knows or has reason to believe 1) that they have begun or expect to begin, use or manufacture of a toxic pollutant not reported in the permit application, or 2) a discharge of a toxic pollutant not limited by this permit has occurred, or will occur, in concentrations that exceed the specified limits in 40 CFR 122.42(a).
12. **Standard Provisions:** This Order includes all items of the attached "Standard Provisions, Reporting Requirements" dated August 1993. In part, these Standard Provisions require submittal within 90 days of adoption of this Order, of reports on Safeguards to Electric Power Failure and Spill Prevention and Contingency Plan.
13. **Effective Date of Permit:** This Order shall serve as National Pollutant Discharge Elimination System permits pursuant to Section 402 of the Federal Water Pollution Control Act, or amendments thereto, and shall become effective on the date of adoption provided the

Regional Administrator, Environmental Protection Agency, has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

14. **Permit Expiration:** This Order expires on May 15, 2001. The discharger must file a Report of Waste Discharge in accordance with Title 23 of the California Code of Regulations, not later than 180 days in advance of such date as application for issuance of new waste discharge requirements.
15. **Rescission of Previous Orders:** This Order supersedes the requirements of Order Nos. 90-095, 91-026, 91-099 and 92-101. Order No. 92-101 is hereby rescinded. Order Nos. 90-095, 91-026, 91-099 are hereby rescinded except as they relate to implementation and enforcement of the above described Settlement Agreement and Cease and Desist Order No. 94-015. The Settlement agreement and Order No. 94-015 shall apply to this Order.
16. The discharger shall comply with all sections of this Order immediately upon adoption.

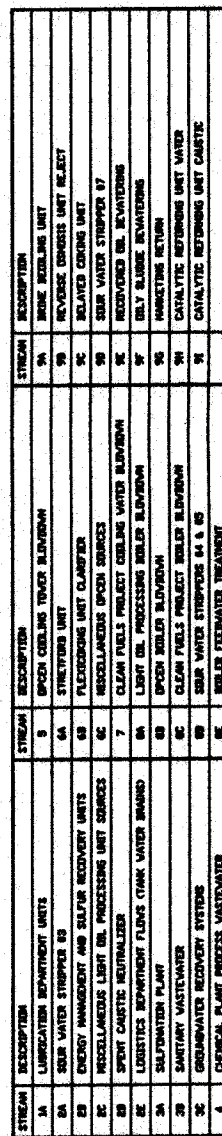
I, Loretta K. Barsamian, Executive Officer do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region on May 15, 1996.

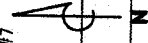
A handwritten signature in black ink, appearing to read "L. K. Barsamian" with a stylized flourish at the end.

LORETTA K. BARSAMIAN  
Executive Officer

**Attachments:**

- Figure 1 - Wastewater Flow Diagram
- Figure 2 - Storm Water Drainage Areas
- Attachment A - Definition of Terms for Chemical Constituents
- Attachment B - Chronic Toxicity Screening Phase Monitoring Requirements
- Standard Provisions & Reporting Requirements, August 1993
- Self-Monitoring Program

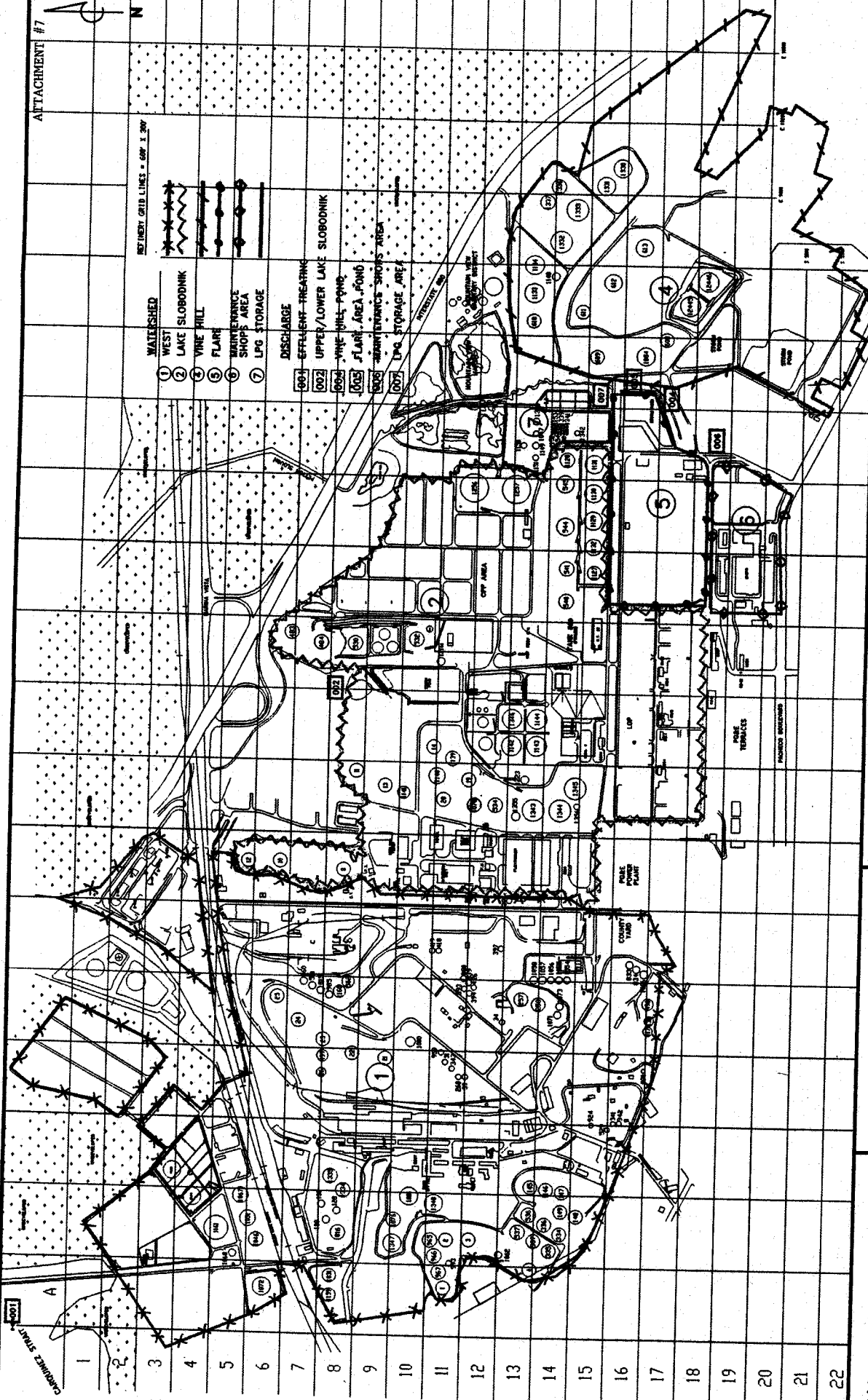
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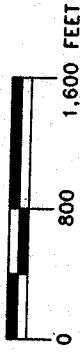
REFINERY GRID LINES = GRP 1, 200'

- WATERSHED**
- 1 WEST LAKE SLOBOODNIK
  - 2 VINE HILL
  - 3 FLARE
  - 4 MAINTENANCE SHOPS AREA
  - 5 LPG STORAGE

- DISCHARGE**
- 001 EFFLUENT TREATING
  - 002 UPPER/LOWER LAKE SLOBOODNIK
  - 003 VINE HILL POND
  - 004 FLARE AREA POND
  - 005 MAINTENANCE SHOPS AREA
  - 006 LPG STORAGE AREA



SCALE



PACIFIC ENVIRONMENTAL GROUP, INC.



SHELL OIL COMPANY  
Martinez Manufacturing Complex  
Martinez, California

WATERSHED AREAS AND DISCHARGE LOCATION INDEX MAP  
OFF-SITE AREAS AND ON-SITE PLANTS

FIGURE:  
2

PROJECT:  
301-037.7A



# ATTACHMENT A

## DEFINITION OF TERMS FOR CHEMICAL CONSTITUENTS

PAHs (polynuclear aromatic hydrocarbons) shall mean the following constituents. Each constituent shall be limited individually at 0.49 µg/l as indicated below.

<u>Constituent</u>	<u>Unit</u>	<u>Monthly Average Effluent Limit</u>
Benz(a)Anthracene	µg/l	0.49
3,4-Benzo(b)Fluoranthene	µg/l	0.49
Benzo(k)Fluoranthene	µg/l	0.49
Benzo(g,h,i)Perylene	µg/l	0.49
Benzo(a)Pyrene	µg/l	0.49
Chrysene	µg/l	0.49
Dibenz(a,h)Anthracene	µg/l	0.49
Indeno(1,2,3-cd)pyrene	µg/l	0.49

PCBs (polychlorinated biphenyls) shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260.

TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity equivalence factors, as shown in the table below.

<u>Isomer Group</u>	<u>Toxicity Equi- valence Factor</u>
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
octa CDD	0.001
2,3,7,8-tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
octa CDF	0.001

## ATTACHMENT B

### CHRONIC TOXICITY

#### I. DEFINITION OF NO OBSERVED EFFECT LEVEL

- A. No observed effect level (NOEL) for compliance determination is equal to  $IC_{25}$  or  $EC_{25}$ . If the  $IC_{25}$  or  $EC_{25}$  cannot be statistically determined, the NOEL shall be equal to the NOEC derived using hypothesis testing.
- B. Effective concentration (EC) is a point estimate of the toxicant concentration that would cause an adverse effect on a quantal, "all or nothing," response (such as death, immobilization, or serious incapacitation) in a given percent of the test organisms. If the effect is death or immobility, the term lethal concentration (LC) may be used. EC values may be calculated using point estimation techniques such as probit, logit, and Spearman-Kärber.  $EC_{25}$  is the concentration of toxicant (in percent effluent) that causes a response in 25% of the test organisms.
- C. Inhibition Concentration (IC) is a point estimate of the toxicant concentration that would cause a given percent reduction in a non-lethal, non-quantal biological measurement, such as growth. For example, an  $IC_{25}$  is the estimated concentration of toxicant that would cause a 25% reduction in average young per female or growth. IC values may be calculated using a linear interpolation method such as USEPA's Bootstrap Procedure.
- D. No observed effect concentration (NOEC) is the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specific time of observation. It is determined using hypothesis testing.

#### II. SCREENING PHASE MONITORING REQUIREMENTS

- A. The discharger shall perform screening phase compliance monitoring:
  - 1. subsequent to any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant concentrations attributable to pretreatment, source control, and waste minimization efforts, or
  - 2. prior to Permit reissuance. Screening phase monitoring data shall be included in the NPDES Permit application for reissuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within 5 years before the permit expiration date.

B. Design of the screening phase shall, at a minimum, consist of the following elements:

- Use of test species specified in Table B-1 and B-2 (attached), and use of the protocols referenced in those tables, or as approved by the Executive Officer;
- Two stages:
  - Stage 1 shall consist of a minimum of one battery of tests conducted concurrently. Selection of the type of test species and minimum number of tests shall be based on Table B-3 (attached); and
  - Stage 2 shall consist of a minimum of two test batteries conducted at a monthly frequency using the three most sensitive species based on the Stage 1 test results and as approved by the Executive Officer.
- Appropriate controls; and
- Concurrent reference toxicant tests.

C. The discharger shall submit a screening phase proposal to the Executive Officer for approval. The proposal shall address each of the elements listed above.

TABLE B-1  
CRITICAL LIFE STAGE TOXICITY TESTS FOR ESTUARINE WATERS

SPECIES	EFFECT	TEST DURATION	REFERENCE
alga ( <i>Skeletonema costatum</i> ) ( <i>Thalassiosira pseudonana</i> )	growth rate	4 days	1
red alga ( <i>Champia parvula</i> )	number of cystocarps	7-9 days	3
giant kelp ( <i>Macrocystis pyrifera</i> )	percent germination; germ tube length	48 hours	2
abalone ( <i>Haliotis rufescens</i> )	abnormal shell development	48 hours	2
oyster ( <i>Crassostrea gigas</i> ) mussel ( <i>Mytilus edulis</i> )	abnormal shell development; percent survival	48 hours	2
Echinoderms (urchins - <i>Strongylocentrotus purpuratus</i> ); (sand dollar - <i>Dendraster excentricus</i> )	percent fertilization	1 hour	2
shrimp ( <i>Mysidopsis bahia</i> )	percent survival; growth	7 days	3
shrimp ( <i>Holmesimysis costata</i> )	percent survival; growth	7 days	2
Topsmelt ( <i>Atherinops affinis</i> )	percent survival; growth	7 days	2
silversides ( <i>Menidia beryllina</i> )	larval growth rate; percent survival	7 days	3

#### TOXICITY TEST REFERENCES

1. American Society for Testing Materials (ASTM). 1990. Standard Guide for conducting static 96-hour toxicity tests with microalgae. Procedure E 1218-90. ASTM, Philadelphia, PA.
2. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. EPA/600/R-95/136. August 1995
3. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. EPA-600/4-90/003. July 1994

**TABLE B-2**  
**CRITICAL LIFE STAGE TOXICITY TESTS FOR FRESH WATERS**

SPECIES	EFFECT	TEST DURATION	REFERENCE
fathead minnow ( <u>Pimephales promelas</u> )	survival; growth rate	7 days	4
water flea ( <u>Ceriodaphnia dubia</u> )	survival; number of young	7 days	4
alga ( <u>Selenastrum capricornutum</u> )	cell division rate	4 days	4

**TOXICITY TEST REFERENCE**

4. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms.  
Third edition. EPA/600/4-91/002. July 1994

TABLE B-3  
TOXICITY TEST REQUIREMENTS FOR STAGE ONE SCREENING PHASE

REQUIREMENTS	RECEIVING WATER CHARACTERISTICS		
	DISCHARGES TO COAST	DISCHARGES TO SAN FRANCISCO BAY†	
	Ocean	Marine	Freshwater
Taxonomic Diversity	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish
Number of tests of each salinity type			
Freshwater†	0	1 or 2	3
Marine	4	3 or 4	0
Total number of tests	4	5	3

† The fresh water species may be substituted with marine species if:

- 1) the salinity of the effluent is above 5 parts per thousand (ppt) greater than 75% of the time, or
- 2) the ionic strength (TDS or conductivity) of the effluent at the test concentration used to determine compliance is documented to be toxic to the test species.

‡ Marine refers to receiving water salinities greater than 5 ppt at least 75% of the time during a normal water year.  
Fresh refers to receiving water with salinities less than 5 ppt at least 75% of the time during a normal water year.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

SHELL MARTINEZ REFINING COMPANY  
MARTINEZ, CONTRA COSTA COUNTY

NPDES NO. CA0005789  
ORDER NO. 96-069

CONSISTS OF

PART A dated August 1993, and

PART B Adopted: May 15, 1996

**PART B**  
**DESCRIPTION OF SAMPLING STATIONS  
AND  
SCHEDULE OF SAMPLING, ANALYSIS & OBSERVATIONS  
FOR  
SHELL MARTINEZ REFINING COMPANY  
NPDES NO. CA0005789**

**I. Description of Sampling Stations**

**A. EFFLUENT**

<u>Station</u>	<u>Description</u>
E-001	At any point in the outfall from the Waste 001 treatment facilities to the discharge point, at which all wastes tributary to the outfall are present.
E-001D	At any point downstream from the disinfection facilities for the refinery sanitary sewage, at which all such sewage are present and adequate disinfection is assured.
E-002	At the point of discharge from the retention ponds for Waste 002.
E-004	At the point of discharge from the retention ponds for Waste 004.
E-005	At the point of discharge from the retention pond for Waste 005.
E-007	At the point of discharge from the retention pond for Waste 007.
E-008	At any point in the outfall for Waste 008 between the point of discharge and the point at which representative storm water tributary to that discharge is present.

**B. RECEIVING WATERS**

<u>Station</u>	<u>Description</u>
C-0	At a point in Carquinez Strait, located over the geometric center of the deepwater diffuser for Waste 001.



C-1	At a point in Carquinez Strait under the wharf, located 75 feet (23 meters) west of the diffuser for Waste 001.
C-2	At a point in Carquinez Strait under the wharf, located 75 feet (23 meters) east of the diffuser for Waste 001.
C-R1	At a point in Carquinez Strait, located at the east end of the wharf.
C-R2	At a point in Carquinez Strait, located at the west end of the wharf.
C-NF	At a point in Carquinez Strait located 15 feet (5 meters) southwest of the diffuser for Waste 001.
C-MF	At a point in Carquinez Strait located 100 feet (30 meters) southwest of the diffuser for Waste 001.
C-FF	At a point in Carquinez Strait located 200 feet (60 meters) southwest of the diffuser for Waste 001.

#### C. INFLUENT WATERS

<u>Station</u>	<u>Description</u>
I-001	Located at any point in the pipe which delivers only reclaimed water to the facility, but upstream of any water treatment unit, blending point or point of use.

## II. SCHEDULE OF SAMPLING AND ANALYSIS

- A. The schedule of sampling and analysis shall be that given in Table 1 (attached).
- B. Sample collection, storage, and analyses shall be performed according to requirements in the latest 40 CFR 136, in the Permit, or as specified by the Executive Officer.

## III. MODIFICATIONS TO PART A

- A. Exclude paragraphs C.3.b., c., and d.; D.4; E.3; and E.5.
- B. Paragraph C.2.a. is modified as follows:

Composite samples of effluent shall be collected on random weekdays and on any day when substantial changes in flow occur during dry weather conditions.

C. Section F.5. is modified as follows:

**F.5. Annual Reporting**

**a. Process Wastewaters:** By January 30 of each year, the discharger shall submit an annual report to the Regional Board covering the previous calendar year for Waste 001. The report shall contain:

- 1) Both tabular and graphical summaries of the monitoring data for all parameters monitored during the previous year.
- 2) A comprehensive discussion of the compliance record and the corrective actions taken or planned which may be needed to bring the discharger into full compliance with the waste discharger requirements.
- 3) List of Approved Analyses to include:
  - a) a list of analyses for which the discharger is approved by the California Department of Health Services,
  - b) a list of analyses performed for the discharger by another approved laboratory shall also be submitted as part of the report, and
  - c) a list of "waived" analyses, as approved.

**b. Storm Water:** The discharger shall submit an annual report by July 1 of each year covering data for the previous wet weather season for the identified storm water discharge points. The annual storm water report shall include:

- 1) a tabulated summary of all sampling results and a summary of visual observations taken during the inspections;
- 2) a comprehensive discussion of the compliance record and the corrective actions taken or planned which may be needed to bring the discharger into full compliance with the waste discharger requirements; and
- 3) a comprehensive discussion of the progress and/or success of source identification and control programs for non-effluent limited parameters.

**IV. CHRONIC TOXICITY MONITORING REQUIREMENT**

**A. Test Species and Frequency:** The discharger shall collect 24-hour composite samples at E-001 on consecutive days for critical life stage toxicity testing as specified in Table 1.

- B. Conditions for Accelerated Monitoring: The discharger shall accelerate the frequency of monitoring to monthly (or as otherwise specified by the Executive Officer) when there is an exceedance of either of the following conditions:
1. three sample median value of 10 TUc, or
  2. single sample maximum value of 20 TUc
- C. Methodology: Sample collection, handling and preservation shall be in accordance with EPA protocols. The test methodology used shall be in accordance with the references cited in the Permit, or as approved by the Executive Officer. A concurrent reference toxicant test shall be performed for each test.
- D. Dilution Series: The discharger shall conduct tests at 100%, 50%, 25%, 10%, 5%, and 2.5%. The "%" represents percent effluent as discharged. The 100% dilution may be omitted if the marine test species specified is sensitive to artificial sea salts.

## V. CHRONIC TOXICITY REPORTING REQUIREMENTS

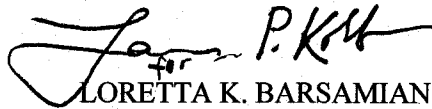
- A. Routine Reporting: Toxicity test results for the current reporting period shall include at a minimum, for each test
1. sample date(s)
  2. test initiation date
  3. test species
  4. end point values for each dilution (e.g. number of young, growth rate, percent survival)
  5. NOEC value(s) in percent effluent
  6. IC<sub>15</sub>, IC<sub>25</sub>, IC<sub>40</sub>, and IC<sub>50</sub> values (or EC<sub>15</sub>, EC<sub>25</sub> ... etc.) in percent effluent
  7. TUc values (100/NOEC, 100/IC<sub>25</sub>, and 100/EC<sub>25</sub>)
  8. Mean percent mortality ( $\pm$ s.d.) after 96 hours in 100% effluent (if applicable)
  9. NOEC and LOEC values for reference toxicant test(s)
  10. IC<sub>50</sub> or EC<sub>50</sub> value(s) for reference toxicant test(s)
  11. Available water quality measurements for each test (ex. pH, D.O., temperature, conductivity, hardness, salinity, ammonia)
- B. Compliance Summary: Each self-monitoring report shall include a summary table of chronic toxicity data from at least eleven of the most recent samples. The information in the table shall include the items listed above under Section A item numbers 1, 3, 5, 6(IC<sub>25</sub> or EC<sub>25</sub>), 7, and 8.
- C. Reporting Raw Data in Electronic Format: On a quarterly basis, by February 15, May 15, August 15, and November 15 of each year, the discharger shall report all chronic toxicity data for the previous calendar quarter in the format specified in "Standardized Electronic Reporting Format for Monitoring Effluent Toxicity," October 1994, SWRCB. The data shall be submitted in high density, double sided 3.5-inch floppy diskettes.

## VI. MISCELLANEOUS REPORTING

- A. The discharger shall record the rainfall on each day of the month and submit the data with each report.
- B. If the discharger wishes to claim the storm water runoff/ballast water allocation credits, the discharger shall determine the storm water runoff/ballast water allocation (daily & monthly) for its discharge using the method described in attached Form A. Form A shall be submitted with the monthly self-monitoring report. The daily maximum allocation must be computed for each day Waste 001 is monitored.
- C. The discharger shall retain and submit (when required by the Executive Officer) the following information concerning the monitoring program for organic and metallic pollutants.
  - a. Description of sample stations, times, and procedures.
  - b. Description of sample containers, storage, and holding time prior to analysis.
  - c. Quality assurance procedures together with any test results for replicate samples, sample blanks, and any quality assurance tests, and the recovery percentages for the internal surrogate standard.
- D. The discharger shall submit in the self-monitoring report the metallic & organic test results together with the quantification limits for all constituents approved for analysis under those protocols (including unidentified peaks). All unidentified (non-Priority Pollutant) peaks detected in the USEPA 624, 625 (or 8240, 8270) test methods shall be identified and semi-quantified. Hydrocarbons detected at  $<10 \mu\text{g/l}$  based on the nearest internal standard may be appropriately grouped and identified together as aliphatic, aromatic and unsaturated hydrocarbons. All other hydrocarbons detected at  $>10 \mu\text{g/l}$  based on the nearest internal standard shall be identified and semi-quantified.
- E. Ballast water treated and discharged as part of Waste 001 shall be metered and the volume recorded in attached Form A for each calendar day. The 30-day average shall be the sum of the daily values in a calendar month divided by the number of days in that month. Ballast-water allocations shall be calculated by multiplying the volume of ballast water, determined above by the appropriate concentration listed under Effluent Limitation B.2. in the permit.
- F. The discharger shall submit with each report a sketch showing the location of all ponds, and treatment facilities of waste discharge. This shall be updated by the discharger as changes occur.

I, Loretta K. Barsamian, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Order No. 96-069.
2. Is effective on the date shown below.
3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger and revisions will be ordered by the Executive Officer, pursuant to 40 CFR 122.62 and 124.4.

  
LORETTA K. BARSAMIAN  
Executive Officer

Effective Date: May 15, 1996

**Attachments:**

Table 1 - Schedule of Sampling, Measurement and Analysis  
Form A - Storm Water/Ballast Water Allocation Procedure

TABLE 1  
SCHEDULE OF SAMPLING, MEASUREMENTS, AND ANALYSIS

<u>Station</u>	<u>Constituent</u>	<u>Unit</u>	<u>Sample Type</u>	<u>Frequency of Analysis</u>
E-001	Flow	MGD	Continuous	Continuous
	BOD	mg/l	Composite	Twice each month
		kg/day		
	TSS	mg/l	Composite	Weekly
		kg/day		
	Settleable Matter	ml/l/hr	Grab	Monthly
	Oil & Grease	mg/l	Grab [1,6]	Monthly
		kg/day		
	Ammonia N	mg/l	Composite	Weekly
		kg/day		
	Total Sulfides	mg/l	Grab [6]	Monthly
	COD	mg/l	Composite	Weekly
		kg/day		
	Acute Fish Toxicity [10]	%Surv	Composite	Weekly
	Crit. Life Stage Tox. Test [11]	[11]	Composite	Quarterly
	pH [2]	-	Continuous	Continuous
	Temperature	Celsius	Continuous	Continuous
	Aluminum	mg/l	Composite	Monthly
		kg/day		
	Arsenic [12]	"	Composite	Monthly
	Cadmium	"	Composite	Monthly
	Chromium			
	Total	"	Composite	Monthly
	Hexavalent	"	Composite	Monthly
	Cobalt	"	Composite	Monthly
	Copper	"	Composite	Monthly
	Silver	"	Composite	Monthly
	Lead	"	Composite	Monthly
	Mercury	"	Composite	Monthly
	Nickel	"	Composite	Monthly
	Vanadium	"	Composite	Monthly
	Zinc	"	Composite	Monthly
	Selenium [9]	mg/l	Composite	Weekly
		kg/day		
	Cyanide [13]	"	Composite	Weekly
	Total Phenols	"	Composite	Weekly
	PAH's [7]	mg/l	Composite	Monthly
		kg/day		

<u>Station</u>	<u>Constituent</u>	<u>Unit</u>	<u>Sample Type</u>	<u>Frequency of Analysis</u>
E-001 (cont.)	PCBs [4]	µg/l	Grab [6]	Yearly
	TCDD Eq. [4]	pg/l	Grab [6]	Yearly
	Benzene [5]	µg/l	Grab [6]	Yearly
	Toluene [5]	µg/l	Grab [6]	Yearly
	Fluoranthene [5]	µg/l	Grab [6]	Yearly
	Standard Observations	-	--	Daily
E-001D	Total Coliform [8]	MPN/100ml	Grab	Twice per week
E-002	Oil & Grease	mg/l	Grab	On each occurrence
	pH	-	"	"
	TOC	mg/l	"	"
	Flow	gallons	Continuous	"
	Specific Conductance	µmhos/cm	Grab	"
	TSS	mg/l	Grab	"
	Copper	mg/l	"	" for first year [15]
	Nickel	mg/l	"	" for first year [15]
	Zinc	mg/l	"	" for first year [15]
	Standard Observations	-	--	On each occurrence
	TPH [14]	µg/l	Grab	" for first year [14]
	Total Phenols	µg/l	Grab	" for first year [14]
E-004 to E-007	Oil & Grease	mg/l	Grab	On each occurrence
	pH	-	"	"
	TOC	mg/l	"	"
	Flow	gallons	Continuous	"
	Specific Conductance	µmhos/cm	Grab	"
	TSS	mg/l	"	"
	Standard Observations	-	--	"
	TPH [14]	µg/l	Grab	First two events [14]
E-008	Oil & Grease	mg/l	Grab	Twice per year
	pH	-	"	"
	TOC	mg/l	"	"
	Flow	gallons	Continuous	"
	Specific Conductance	µmhos/cm	Grab	"

<u>Station</u>	<u>Constituent</u>	<u>Unit</u>	<u>Sample Type</u>	<u>Frequency of Analysis</u>
E-008	TSS	mg/l	Grab	Twice per year
(cont.)	Standard	-	--	"
	Observations			
	TPH [14]	µg/l	Grab	First two events [14]
C-0	pH	-	Grab	Quarterly
	D.O.	mg/l	"	"
	Temperature	Celsius	"	"
	Sulfides [3]	mg/l	"	"
	Unionized	mg/l	"	"
	Ammonia			
	TDS	mg/l	"	"
	Standard Obs.	-	--	"
I-001	(As necessary and in accordance with the Specification B.5 of the permit to determine credit for reclaimed water use.)			

Footnotes for Table 1:

1. Oil and grease sampling shall consist of 3 grab samples taken at regular intervals during the sampling day, with each being collected in a glass container. The entire volume of each sample shall be composited prior to analysis. Each glass container used for sample collection or mixing shall be thoroughly rinsed with solvent rinsings as soon as possible after use, and the solvent rinsings shall be added to the composite wastewater sample for extraction and analysis.
2. Daily minimum and maximum for pH shall be reported.
3. Receiving water analysis for sulfides should be run when dissolved oxygen is less than 5.0 mg/l.
5. The latest versions of USEPA Methods 624 (or 8240), and 625 (or 8270) shall be used. The results from USEPA Method 624 shall be used to determine compliance with the effluent limits for benzene and toluene. The results from USEPA Method 625 shall be used to determine compliance with the effluent limits for fluoranthene. Additionally, all data results from these analyses shall be reported as specified under Section VI.D. of the Self-Monitoring Program.
4. The latest versions of USEPA Methods 608 (or 8080) shall be used that to determine compliance with the limits for Total PCBs. The discharger shall attempt to achieve the lowest detection limits commercially available using this method and shall achieve the maximum quantification limit listed below:

<u>Constituent</u>	<u>Quantification Limit</u>
Each Aroclor group	1 µg/l



The latest version of USEPA Method 1613 shall be used to determine compliance with the limit for TCDD Equivalents. The discharger shall attempt to achieve the lowest detection limits commercially available and shall achieve the maximum quantification limits listed below. Analysis results at or below the quantification limits listed below may be considered zero for use in the calculations for compliance determination with the TCDD Equivalents limit.

<u>Isomer Group</u>	<u>Quantification Limit</u>
2,3,7,8-tetra CDD	5 pg/l
2,3,7,8-penta CDD	5 pg/l
2,3,7,8-hexa CDDs	10 pg/l
2,3,7,8-hepta CDD	10 pg/l
octa CDD	25 pg/l
2,3,7,8-tetra CDF	5 pg/l
1,2,3,7,8-penta CDF	5 pg/l
2,3,4,7,8-penta CDF	5 pg/l
2,3,7,8-hexa CDFs	10 pg/l
2,3,7,8-hepta CDFs	10 pg/l
octa CDF	25 pg/l

If the analysis performed for PCBs and dioxins/furans cannot achieve the quantification limits specified above, the discharger shall provide an explanation in the self-monitoring report. Another sample shall be analyzed if the reported quantification limits are significantly above the limits specified above.

6. Grab Samples shall be collected coincident with composite samples collected for the analysis of regulated parameters.
7. Polynuclear aromatic hydrocarbons shall be analyzed using the latest version of USEPA Method 610 (8100 or 8310). The discharger shall attempt to achieve the lowest detection limits commercially available. If an analysis cannot achieve a quantification limit for a particular sample at or below the effluent limits for PAHs, the discharger shall provide an explanation in the self-monitoring report. Note that the samples must be collected in amber glass containers. These samples shall be collected for the analysis of the regulated parameters. An automatic sampler which incorporates glass sample containers and keeps the samples refrigerated at 4°C and protected from light during compositing may be used. The 24-hour composite samples may consist of eight grab samples collected at 3-hour intervals. The analytical laboratory shall remove flow-proportioned volumes from each sample vial or container for the analysis.
8. When replicate analyses are made of a coliform sample, the reported result shall be the arithmetic mean of the replicate analysis values.
9. Selenium must be analyzed for only by the atomic absorption, gaseous hydride procedure (EPA method No. 270.3/ Standard Method No. 303E).

10. Rainbow trout, and three-spine stickleback are to be tested to determine compliance with Effluent Limitation B.8. The discharge may use the Third Edition of the USEPA Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms until otherwise specified by the Executive Officer. The discharger may substitute the three-spine stickleback with fathead minnow if stickleback are not available. In this case, the discharger shall document in the self-monitoring report their attempts to obtain stickleback for testing.
11. Critical Life Stage Toxicity Test shall be performed using *Mysidopsis bahia*. Compliance with the effluent limit shall be determined using the more sensitive of the growth and survival endpoints.
12. Arsenic must be analyzed for only by the atomic absorption, gaseous hydride procedure (EPA Method 206.3/ Standard Method No. 303E).
13. The discharger may, at their option, analyze for cyanide as Weak Acid Dissociable Cyanide using protocols specified in Standard Method No. 4500-CN-I, latest edition.
14. Total Petroleum Hydrocarbons (TPH) for gasoline and diesel, shall be analyzed and characterized by GCFID with fused capillary column. The samples are to be prepared by using EPA Methods 5030 and 3510. Storm water discharge samples shall be collected for TPH analysis from the first and second discharge events following adoption of this permit, from each station. TPH analysis on Station E-002 samples from each discharge for the entire first wet weather year (96/97) shall be conducted up to a total of ten sample events.
15. Copper, nickel, and zinc shall be monitored in E-002 for at least the first wet weather year (96/97) following adoption of this permit. If this first year of monitoring does not yield a total of at least ten samples, the discharger shall continue to monitor for these constituents during the following year(s) until a collective total of ten discharge events have been sampled.